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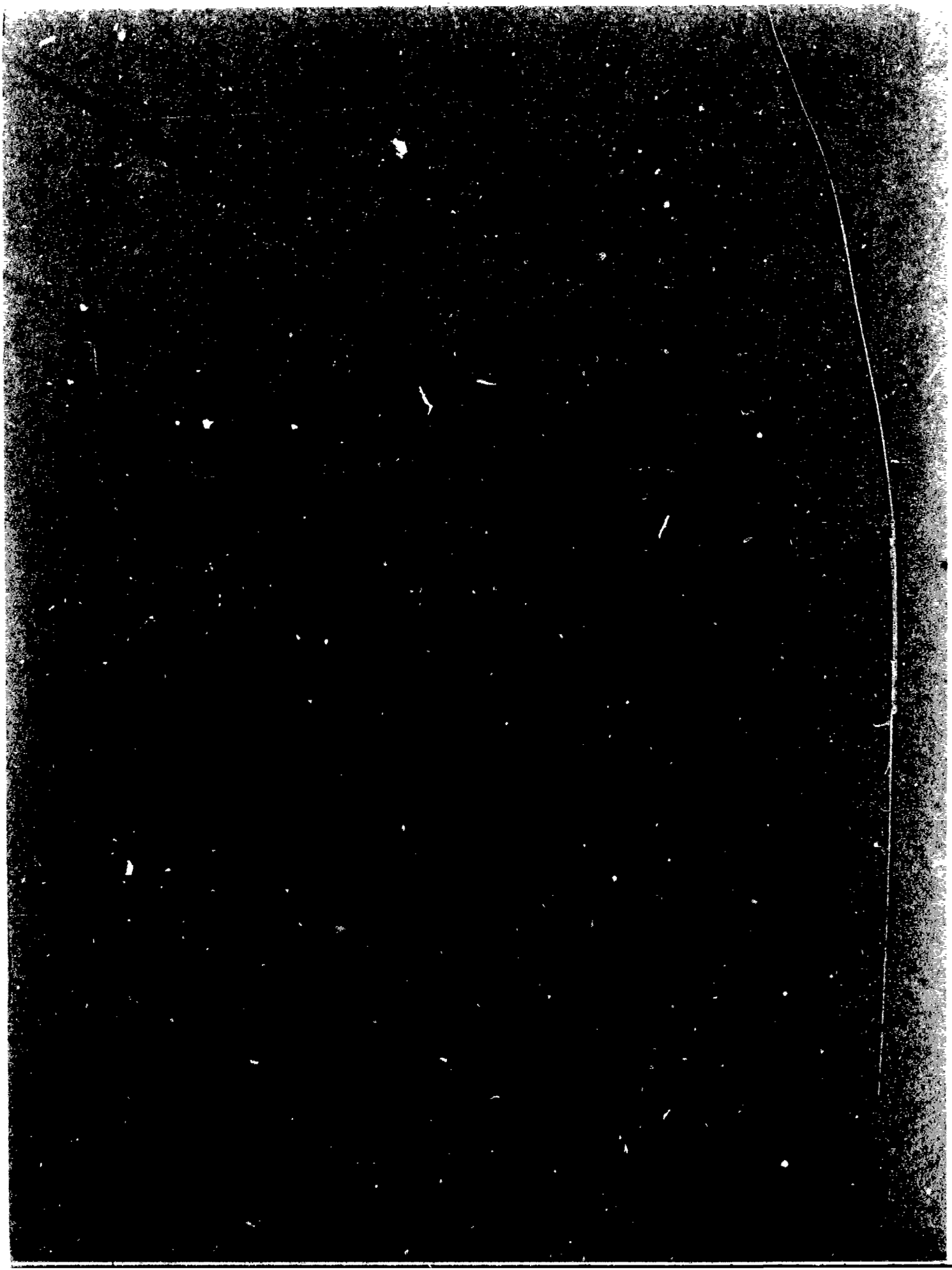
ABSTRACT

Two reports supplementing the product evaluation of the Learning Booth are presented. The first, "Learing Booth Performance and Subsequent Reading Ability," by N. F. Rayder, examines the relationship between the Learning Booth experience and reading. To do this, readingscores for 65 first-grade Follow Through children were compared with their intelligence test scores and Learning Booth performance data. The second report "A Measure of Intelligence and Subsequent Learning Booth Performance," by Margery Nakamura and Anne Rhodes, explores a child's performance as measured by his Learning Booth achievement in relation to the child's score on a traditional test of intelligence (the WPPSI). Performance was found to be independent of intelligence test scores. (KM)



# THE LEARNING BOOTH

## PRELIMINARY REPORT OF RESEARCH ACTIVITIES

Evaluation Component
Division III - Early Childhood Education and Development
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# THE LEARNING BOOTH - PRELIMINARY REPORT OF RESEARCH ACTIVITIES

The information in this document supplements the product evaluation conducted on the Learning Booth (see report: The Learning Booth - Product Evaluation Report by Nicholas Rayder et al).

The product evaluation report was primarily concerned with just that, "product evaluation." Information was collected at various stages of the product's life that fed directly into the development of the product. Ultimately, the "finished" product was operationally field tested, met preset criteria for judging it effective, and was released as a Laboratory product.

The efforts reported in this supplement originate out of desire to know more about the released product. its dynamics, and how it interacts with other variables. Relationships between "intelligence" are explored as is the connection between booth achievement and subsequent reading test scores.

1. Learning Booth Performance and Subsequent Reading Ability by N. F. Rayder

Available data permit us to examine the relationship of the Learning Booth experience and reading. To do this, the 1970-71 first-grade district reading test scores (Cooperative Primary Reading Test) were obtained for 65 Follow Through childre in district A for whom 1969-70 Learning Booth performance data was available. Intelligence test scores collected at the beginning of kindergarten were also available for these 65 children as was an indication of their chronological age.

Although a high correlation between a measure of "intellectual ability" measured by four subtests of the Wechsler PPSI with a standardized reading test, such as the Cooperative Primary Reading Test is to be expected, it is prudent to control for "intelligence" and to examine the unique contribution the booth experience had on reading test scores. Our procedure also controlled for chronological age.

Using multiple linear regression, the contribution of a variable or a subset of variables in explaining or predicting a criterion, in this case a first-grade standardized reading score, is determined by an index of relationship calculated from the variables included. This index is then compared to an index with the variables deleted, the resulting change being attributed to those deleted variables.

Before regression models were formulated and computed, the data were examined to gain "a feel-for-it." Scatter plots suggested that a non-linear relationship may exist between the Learning Booth variables and the reading achievement scores. To account for this possible higher-order curvilinear relationship and to explore the possibility that time and phase interact, three additional Learning Booth variables were generated from (1) the amount of time a child spent in the booth and (2) the final step the child completed. Variable (3) was designated to reflect

on interaction between (1) and (2) and was constructed by simply multiplying a child's time spent in the booth times the final step he completed. Generated variable (4) was time squared, and generated variable (5) was final step squared. These variables were squared to account for the possibility of a curvelinear relationship between them and the criterion.

The intercorrelations of the eight variables in this study appear in Table 1.

Table 1. INTERCORRELATIONS BETWEEN LEARNING BOOTH VARIABLES AND INTELLIGENCE SCORES ON 65 CHILDREN COLLECTED IN 1969-70 AND 1970-71 COOPERATIVE READING TEST COLLECTED IN THE WINTER OF 1971

| Variable | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|
| 1. Score on 4 Wechsler Subtests taken at beginning of kindergarten | -04 | -14 | 05 | -08 | -13 | 04 | 39 |
| 2. Age at time of Wechsler test (in months) | - | -25 | -10 | -23 | -26 | -15 | 04 |
| 3. Total time spent in booth (in minutes) | | - | 76 | 96 | 97 | 77 | 08 |
| 4. Final phase-step completed (1 to 11) | | | - | 83 | 70 | 98 | 18 |
| 5. Time X step | | | | - | 97 | 87 | 16 |
| 6. $(Time)^2$ | | | | | - | 74 | 11 |
| 7. $(Step)^2$ | | | | | | - | 18 |
| 8. 1st Grade Cooperative Reading Score | | | | | | | - |

As one would expect, the correlation between the I.Q. measure (Variable 1) and the Cooperative Reading Test score (8) is positive. The total time spent in the booth (3) and final step (4) correlated .08 and .18, respectively, with end of 1st grade reading score, neither of which is statistically significant. However,

the generated variables reflecting more complex relationships between booth and reading score correlated 16, 11 and 18 with first-grade reading score, and while not statistically significant were in a positive direction.

Regression Analysis

The data suggested that booth performance variables were related to end of first-grade reading scores. To explore this possibility, multiple regression analysis was utilized. A multiple regression model was run with the following specifications:

Criterion = first-grade reading score

Predictors = step, time, step x time, $(time)^2$, $(step)^2$, I.Q., and age.

The resulting RSQ (multiple correlation coefficient R squared--an index of prediction) was 29 and can be interpreted as the percent of variance in the criterion that is accounted for or contributed by the predictors.

A restricted model, deleting all Learning Booth data but retaining I.Q. test score and age, was then run. The RSQ dropped to .16. The difference 29 - 16 = 13 can be directly attributed to information contributed by Learning Booth experience. That is, when the effect of I.Q. and age are partialed out or statistically controlled the Learning Booth kindergarten experience accounts for about 13% of end of 1st grade reading scores. Although rather modest, given the restricted nature of the criterion instrument and the time lapse between booth training and subsequent reading assessment, the finding is noteworthy. The index of predictability with booth data included and controlling for intelligence test score and age is statistically significant at the .10 level (see Table 2) over no knowledge of booth performance. More important is the modest, yet demonstrated relationship between experiences a kindergarten child has in the Learning Booth, an index of language performance measured by a standardized instrument one year after that experience.

Table 2. F TEST BETWEEN FULL MODEL WITH ALL VARIABLES PREDICTING READING SCORES AND A RESTRICTED MODEL WITH LEARNING BOOTH DATA DELETED

| | RSQ | SS (ERROR) | Mean Squares | F |
|---|---|---|---|---|
| Full | .2870 | 6099.74 | 107.01 | 2.09 |
| Restricted | .1563 | 7221.12 | x x x | df = 8, 57 |
| | .1310 | 1121.37 | 247.27 | sig. .10 level |

Formula: $$\frac{RSQ_{\text{Full Model}}/df_1}{(1 - RSQ_{\text{Restricted Model}})/df_2}$$

Where: $df_1$ = number of linearally independent predictors = 8

$df_2$ = number of cases minus number of independent predictors = 65 - 8 = 57

Note: Another study is being conducted with booth data on a larger number of kindergarten children from two other districts and their subsequent first-grade language performance on the Cooperative Primary Reading Test and the Metropolitan Reading Readiness Test.

## 2. A Measure of Intelligence and Subsequent Learning Booth Performance

by Margery Nakamura and Anne Rhodes

This report explores a child's performance as measured by his Learning Booth achievement in relation to the child's score on a traditional test of intelligence.

The population in this study is comprised of 36 1969-70 kindergarten children for whom both Learning Booth data and scores on four subtests of the Wechsler Preschool and Primary Scale of Intelligence (WPPSI) was available.

Ethnically, this group of children is mixed and has experienced education in a community that has been integrated since 1967. This group also is biased with higher than average Wechsler (WPPSI) scores. The range of the group on the four subtests (vocabulary, similarity, picture completion and block design) was from 25 to 65 with an average score of 44.6 and a standard deviation of 8.8.

Scatter plots and correlations for Wechsler total score made on the four subtests with total time spent in the booth and with final phase completed are shown in Figures 1 and 2, respectively.

The correlation between pre-WPPSI score and time spent in the booth was -.14, suggesting little relationship (negative) between these variables. Further, as shown in Figure 2, the relationship between a child's achievement in the booth and his intelligence test score is negligible.



The interpretation of these data is important. Learning Booth performance represents as pure an index of basic learning ability as we have in the responsive program or in most school programs for that matter. There are qualities that make it a good assessment of a child's abilities. No child had experienced the booth before kindergarten. No child was forced to go to the booth. A child who enters the booth is free to leave when bored or frustrated. All children are

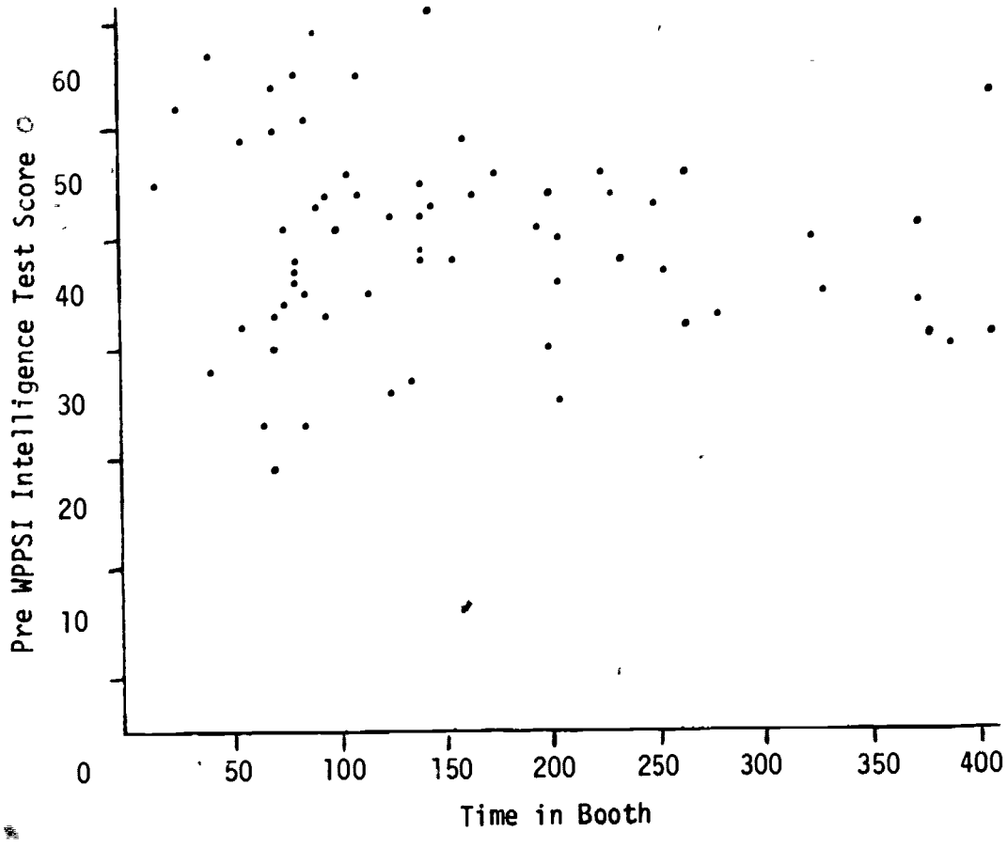


Figure 1. DISTRICT A TOTAL TIME IN BOOTH 1969-70
WPPSI PRE 1969-70 (r = -.14)

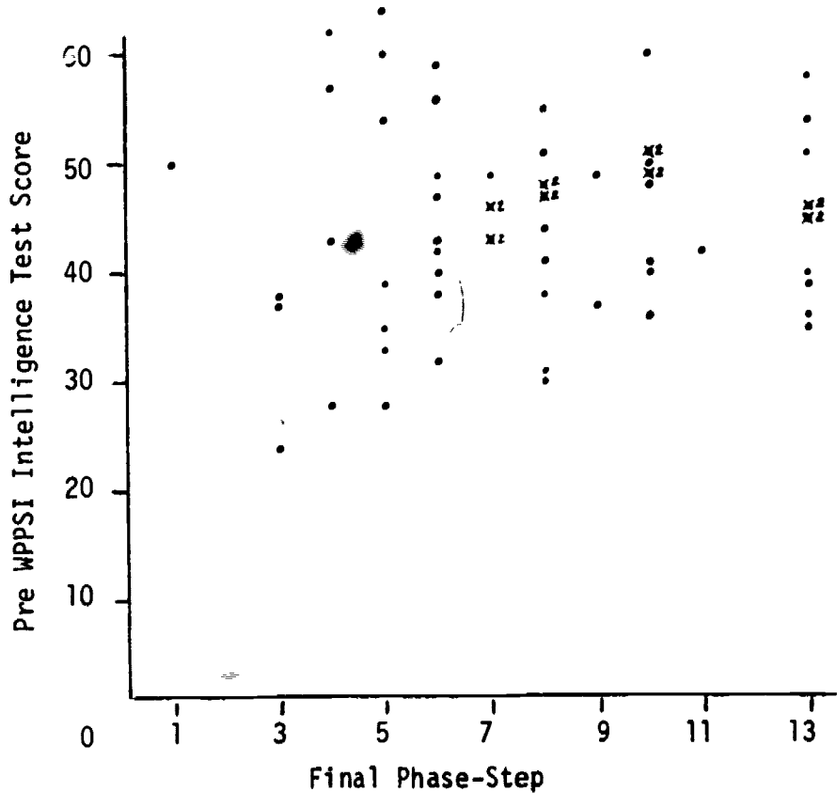


Figure 2. DISTRICT A 1969-70 FINAL STEP X WPPSI PRE TOTAL
(r = .05)

presented with new learning material that is interesting and exciting. And, while in the Learning Booth, a child is confronted with learning specific concepts, relationships, and rules and solving a variety of problems. Consequently, experiences associated with the Learning Booth represent a good index of learning potential, of motivation to learn new things and solve new problems, and of the basic ability to learn.

For the group of kindergarten children in district A, performance in the Learning Booth is independent of intelligence test scores.